ENERGY AND COMFORT

Indoor Air Quality

IAQ-CALC
Indoor Air Quality Meter

Model 7545

Operation and Service Manual

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Chapter 1

Unpacking and Parts Identification

Carefully unpack the instrument and accessories from the shipping container. Check the individual parts against the list of components below. If anything is missing or damaged, notify TSI immediately.

1. Carrying case
2. Instrument
3. USB cable
4. CD-ROM with downloading software
5. Calibration collar
6. AC adapter

Chapter 2

Setting-up

Supplying Power to the Model 7545 IAQ-CALC Indoor Air Quality Meter

The Model 7545 can be powered in one of two ways: four size AA batteries or the optional AC adapter.

Installing the Batteries

Insert four AA batteries as indicated by the diagram located on the inside of the battery compartment. The Model 7545 is designed to operate with either alkaline or NiMH rechargeable batteries, although it will not recharge NiMH batteries. Battery life will be shorter if NiMH batteries are used. Carbon-zinc batteries are not recommended because of the danger of battery acid leakage.

Using the Optional AC Adapter

When using the AC adapter, the batteries (if installed) will be bypassed. Be sure to provide the correct voltage and frequency, which is marked on the back of the AC adapter. The AC adapter is not a battery charger.

Using The Probe

The sensing probe relies on the diffusion of air. For best results, try to keep the sensing probe surrounded by moving air. Do ***not*** breathe on the probe. Humans exhale CO_2 levels exceeding 10,000 ppm and it may take time for the probe to re-stabilize. Use the probe holder to support the probe when in continuous data logging mode.

Connecting to a Computer

Use the USB Cable provided with the Model 7545 to connect the instrument to a computer. Connect the end labeled “COMPUTER” to the computer USB port and the other end to the data port of the Model 7545.

For more information on how to download stored data see Chapter 3 section titled **LogDat2™ Downloading Software**.

Caution: This symbol is used to indicate that the data port of the Model 7545 is **not** intended for connection to a public telecommunications network. Connect the USB data port only to another USB port.

Chapter 3

Operation

Keypad Functions

ON/OFF Key	Press to turn the Model 7545 on and off. During the power up sequence the display will show the following: Model Number, Serial Number, Software Revision and Last Date Calibrated.
Arrow (▲▼) Keys	Press to scroll through choices while setting a parameter. Pressing the ▲▼ keys simultaneously will lock the keypad to prevent unauthorized adjustments to the instruments. To unlock the keypad, press the ▲▼ keys simultaneously.
↵ (Enter) Key	Press to accept a value or condition.
Arrow (◄ or ►) and Menu Soft Keys	Press arrow keys to change choices while setting a parameter. Press the Menu soft key to select the Menu selections, which are Display Setup, Settings, Barometric Pressure, Data Logging, Applications, Calibration.

Common Terms

In this manual there are several terms that are used in different places. The following is a brief explanation of the meanings of those terms.

Sample	Consists of all of the measurement parameters stored at the same time.
Test ID	A group of samples. The statistics (average, minimum, maximum, and count) are calculated for each test ID. The maximum number of test IDs is 100.

Time Constant	The time constant is an averaging period. It is used to dampen the display. If you are experiencing fluctuating flows, a longer time constant will slow down those fluctuations. The display will update every second, but the displayed reading will be the average over the last time constant period. For example, if the time constant is 10 seconds, the display will update every second, but the displayed reading will be the average from the last 10 seconds. This is also referred to as a "moving average".
Logging Interval	The logging interval is a frequency period that the instrument will log readings. For example, if the logging interval is set to 30 minutes, each sample will be the average of the last 30 minutes.

Menus

DISPLAY SETUP

Display setup menu is where you will setup the desired parameters to be displayed on the running screen. With a parameter highlighted you can then use the ON soft key to have it show up on the running screen or select the OFF soft key to turn off the parameter. Use PRIMARY soft key to have a parameter show up on the running screen in a larger display. Only one parameter can be selected as a primary, and up to 2 secondary parameters can be selected at one time.

SETTINGS

Settings menu is where you can set the general settings. These include Language, Beeper, Select Units, Time Constant, Contrast, Set Time, Set Date, Time Format, Date Format, Number Format, Backlight and Auto Off. Use the ◄ or ➤ soft keys to scroll through the settings for each option and use the ↵ key to accept settings.

BAROMETRIC PRESSURE

Barometric Pressure menu is where you set the barometric pressure, which can affect the CO_2 measurement.

ZERO CO

Zero CO menu item sets the baseline (zero) reading for the CO sensor. Only zero the CO sensor in fresh air, where no CO is present, or with the probe connected to zero gas.

DATA LOGGING

Measurements

Measurements to be logged are independent of measurements on the display, and must therefore be selected under DATA LOGGING → Measurements.

Log Mode/Log Settings

You can set Log Mode to Manual, Auto-save or Cont-key.

- Manual mode does not automatically save data, but instead prompts the user to save a sample.
- In Auto-save mode, the user manually takes samples that are automatically logged.
- In Cont-key mode, the user starts taking readings and logging by pressing the ↵ key. The instrument will continue taking measurements until the ↵ key is pressed again.
- Auto-save and Cont-Key modes have the following additional Log Settings:

Mode	Log Settings
Auto-save	Log Interval
Cont-key	Log Interval

- Pressing the ▲▼ keys simultaneously will lock the keypad to prevent unauthorized adjustments to the instruments. To unlock the keypad, press the ▲▼ keys simultaneously.

Delete Data

Use this to delete all data, delete test or delete sample.

% Memory

This option displays the memory available. Delete All, under Delete Data, will clear memory and reset the memory available.

APPLICATIONS

You can choose % Outside Air in the Applications menu. After choosing this application, take measurements or enter data for each line.

LogDat2™ Downloading Software

The Model 7545 comes with special software called LogDat2 Downloading Software, which is designed to provide you with maximum flexibility and power. To install this software on your computer, follow the instructions on the label of the LogDat2 CD-ROM.

To download data from the Model 7545, connect the supplied computer interface USB cable to the Model 7545 and to a computer USB port. Then run the LogDat2 downloading software. Within the LogDat2 software, either select the tests to be downloaded or double-click on a test to open it.

Chapter 4

Maintenance

The Model 7545 requires very little maintenance to keep it performing well.

Recalibration

To maintain a high degree of accuracy in your measurements, we recommend that you return your Model 7545 to TSI for annual recalibration. Please contact one of TSI's offices or your local distributor to make service arrangements and to receive a Return Material Authorization (RMA) number. To fill out an online RMA form, visit TSI's website at http://service.tsi.com.

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The Model 7545 can also be recalibrated in the field using the CALIBRATION menu. These field adjustments are intended to make minor changes in calibration to match a user's calibration standards. The field adjustment is NOT intended as a complete calibration capability. For complete, multiple-point calibration and certification, the instrument must be returned to the factory.

Cases

If the instrument case or storage case needs cleaning, wipe it off with a soft cloth and isopropyl alcohol or a mild detergent. Never immerse the Model 7545. If the enclosure of the Model 7545 or the AC adapter becomes broken, it must be replaced immediately to prevent access to hazardous voltage.

Storage

Remove the batteries when storing the unit for more than one month to prevent damage due to battery leakage.

Chapter 5

Troubleshooting

Table 5-1 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the Model 7545. If your symptom is not listed, or if none of the solutions solves your problem, please contact TSI.

Table 5-1: Troubleshooting the Model 7545

Symptom	Possible Causes	Corrective Action
No Display	Unit not turned on	Switch unit on.
	Low or dead batteries	Replace batteries or plug in AC adapter.
	Dirty battery contacts	Clean the battery contacts.
Humidity reading near zero or not believable	Probe exposed to intense light	Shade the probe while taking samples.
High CO_2 levels	Breathing on probe	Shield probe from breath and allow instrument to re-stabilize.
No response to keypad	Keypad locked out	Unlock keypad by pressing ▲▼ keys simultaneously.
Instrument Error message appears	Memory is full	Download data if desired, then DELETE ALL memory.
	Fault in instrument	Factory service required on instrument.

WARNING!
Remove the probe from excessive temperature immediately: excessive heat can damage the sensor. Operating temperature limits can be found in Appendix A, Specifications.

Appendix A

Specifications

Specifications are subject to change without notice.

CO_2:

Range:	0 to 5000 ppm
Accuracy[1]:	±3% of reading or ±50 ppm, whichever is greater
Resolution:	1 ppm
Sensor type:	Non-Dispersive Infrared (NDIR)

CO Sensor:

Range:	0 to 500 ppm
Accuracy:	±3% of reading or ±3 ppm, whichever is greater [add ±0.28%/°F (±0.5%/°C) away from calibration temperature]
Resolution:	0.1 ppm
Response time:	<60 seconds to 90% of final value.
Sensor type:	Electro-chemical

Temperature:

Range:	32 to 140°F (0 to 60°C)
Accuracy[2]:	±1.0°F (±0.6°C)
Resolution:	0.1°F (0.1°C)
Response time:	30 seconds (90% of final value, air velocity at 2 m/s)
Display units:	°F or °C (user selectable)
Type:	Thermistor

Humidity*:*

Range:	5 to 95% RH
Accuracy[2]:	±3.0% RH (includes ±1% hysteresis)
Resolution:	0.1% RH
Response time:	20 seconds (for 63% of final value)
Sensor type:	Thin-film capacitive

Instrument Temperature Range:

Operating (Electronics):	40 to 113°F (5 to 45°C)
Storage:	-4 to 140°F (-20 to 60°C)

Instrument Operating Conditions:

Altitude up to 4000 meters
Relative humidity up to 80% RH, non-condensing
Pollution degree 1 in accordance with IEC 664
Transient over voltage category II

Data Storage Capabilities:

Range: 26,900 data points with key (4) measured parameters enabled

Logging Interval:

Intervals: 1 second up to 1 hour (user selectable)

Time Constant:

Intervals: 1 sec, 5 sec, 10 sec, 20 sec, 30 sec (user selectable)

External Meter Dimensions:

3.3 in. × 7.0 in. × 1.8 in. (8.4 cm × 17.8 cm × 4.4 cm)

Meter Probe Dimensions:

Probe length: 7.0 in. (17.8 cm)
Probe diameter of tip: 0.75 in. (1.9 cm)

Meter Weight:

Weight with batteries: 0.6 lbs (0.27 kg)

Power Requirements:

Four AA-size batteries (included) or AC adapter (optional) 9 VDC, 300 mA, 4-18 watts (input voltage and frequency vary depending on which adapter is used)

[1] Add ±0.2%/°F (±0.2%/°C) away from calibration temperature.

[2] At 77°F (25°C). Add uncertainty of ±0.2%/°F (±0.2%/°C) away from calibrated temperature

[3] At 77°F (25°C). Add uncertainty of ±0.03% RH/°F (±0.03% RH/°C) away from calibrated temperature.

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